

## EXPLANATION OF IFR ENROUTE TERMS AND SYMBOLS

The discussions and examples in this section will be based primarily on the IFR (Instrument Flight Rule) Enroute Low Altitude Charts. Other IFR products use similar symbols in various colors (see Section 3 of this guide). The chart legends list aeronautical symbols with a brief description of what each symbol depicts. This section will provide a more detailed discussion of some of the symbols and how they are used on IFR charts.

NACO charts are prepared in accordance with specifications of the Interagency Air Cartographic Committee (IACC), and are approved by representatives of the Federal Aviation Administration and the Department of Defense. Some information on these charts may only apply to military pilots.

### AIRPORTS

All active airports with hard-surfaced runways of 3000' or longer are shown on FAA IFR Enroute Charts. All active airports with approved instrument approach procedures are also shown regardless of runway length or composition. Charted airports are classified according to the following criteria:

The following runway compositions (materials) constitute a hard-surfaced runway: asphalt, bitumen, concrete, and tar macadam. Runways that are not hard-surfaced have a small letter "s" following the runway length, indicating a soft surface.

LOW/ HIGH ALTITUDE



**Blue** – Airports with an approved Department of Defense (DOD) Low Altitude Instrument Approach Procedure and/or DOD RADAR MINIMA published in DOD FLIPS (Flight Information Publications), the FAA Terminal Procedures Publication (TPP), the Supplement Alaska or the Terminal Alaska volume.

**Green** – Airports and seaplane bases with an approved Low Altitude Instrument Approach Procedure published in the FAA TPP volumes.

**Brown** – Airports and seaplane bases that do not have a published Instrument Approach Procedure.

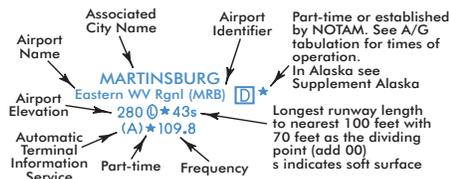
Airports are plotted in their true geographic position unless the symbol conflicts with a radio aid to navigation (navaid) at the same location. In such cases, the airport symbol will be displaced, but the relationship between the airport and the navaid is retained.

Airports are identified by the airport name. In the case of military airports, the abbreviated letters AFB (Air Force Base), NAS (Naval Air Station), NAF (Naval Air Field), MCAS (Marine Corps Air Station), AAF (Army Air Field), etc., appear as part of the airport name.

Airports marked "Pvt" immediately following the airport name are not for public use, but otherwise meet the criteria for charting as specified above.

Runway length is the length of the longest active runway (including displaced thresholds but excluding overruns) and is shown to the nearest 100 feet using 70 feet as the division point; e.g., a runway of 8,070' is labeled 81.

#### LOW ALTITUDE - U.S. & ALASKA



#### Lighting Capability:

- L Lighting available
- ⊙ Pilot Controlled Lighting
- No lighting available
- ★ Part-time or on request

For complete information consult the Airport / Facility Directory or FLP IFR Supplement.

1. Airport elevation given in feet above or below mean sea level.
2. Pvt - Private use, not available to general public.
3. A solid line box enclosing the airport name indicates FAR 93 Special Requirements- see Directory/Supplement
4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special VFR flight is prohibited
5. [ ] or [ ] following the airport name indicates Class C or Class D airspace.
6. There is no A/G tabulation on Alaska Low Altitude Charts.
7. Airport symbol may be offset for enroute navigational aids.
8. City names for military and private airports are not shown.

A L symbol following the elevation under the airport name means that runway lights are on during hours of darkness. A ⊙ symbol indicates there is Pilot Controlled Lighting. A ⊙★ symbol means the lighting is less than continuous. The pilot should consult the Airport/Facility Directory for light operating procedures. The Airman's Information Manual thoroughly explains the types and uses of airport lighting aids.

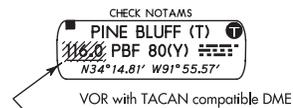
### RADIO AIDS TO NAVIGATION (NAVAIDS)

All IFR radio navaids that have been flight-checked and are operational are shown on IFR enroute charts. VHF/UHF navaids (VORs, TACANs, and UHF NDBs) are shown in black, and LF/MF navaids (Compass Locators and Aeronautical or Marine NDBs) are shown in brown.

On enroute charts, information about radio nav aids is boxed as illustrated below. To avoid duplication of data, when two or more radio nav aids in a general area have the same name, the name is usually printed only once inside an identification box with the frequencies, TACAN channel numbers, identification letters, or Morse Code identifications of the different nav aids all shown in appropriate colors. The decision to use separate or combined boxes is made in each case on the basis of reducing chart clutter and providing clear identification of the radio nav aids.

In extremely congested areas, the nav aid box will contain only the 3-letter identifier, and you will find the complete nav aid box in the nearest open area on the chart.

Radio nav aids that may be scheduled for some alteration within the lifespan of the charts have an operational note added. This operational note may include the projected dates and new frequency, when known, and advises the pilot of the contemplated action. The affected component is indicated by diagonal lines over the frequency or channel.



Underline indicates No Voice Transmitted on this frequency

TACAN channels are without voice but not underlined

Overprint of affected data indicates Abnormal Status, i.e., CHECK NOTAMS/DIRECTORY

(T) Frequency Protection - usable range 25 NM at 12000' AGL

(Y) TACAN must be placed in "Y" mode to receive distance information

(A) ASOS/AWOS - Automated Surface Observing Station/Automated Weather Observing Station

(L) Frequency Protection - usable range 40 NM at 18000' AGL

(H) HIWAS - Hazardous Inflight Weather Advisory Service

(T) TWEB - Transcribed Weather Broadcast

Automated weather, when available, is broadcast on the associated NAVAID frequency.

For terminal weather frequency see A / G Voice Communication Tab under associated airport. (U.S. Low only)



Part-time or On-Request NDB with DME

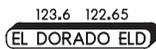
DME channel and paired VHF frequency are shown



WAYPOINT



FSS associated with a NAVAID



Name and identifier of FSS not associated with NAVAID

Shadow NAVAID Boxes indicate Flight Service Station (FSS) locations. Frequencies 122.2, 255.4 and emergency 121.5 and 243.0 are normally available at all FSSs and are not shown. All other frequencies are shown above the box.

Certain FSSs provide Local Airport Advisory (LAA) on 123.6.

Frequencies transmit and receive except those followed by R or T: R - Receive only T - Transmit only

In Canada, high altitude shadow boxes indicate FSSs with standard group frequencies of 121.5, 126.7 and 243.0.



Remote Communications Outlet (RCO) FSS name and remoted frequency are shown

Location symbol for an FSS or RCO when not located at a facility or an airport.



Controlling FSS Name

Thin Line NAVAID Boxes without frequencies and controlling FSS name indicate no FSS frequencies available. Frequencies positioned above thin line boxes are remoted to the NAVAID sites. Other frequencies at the controlling FSS named are available, however, altitude and terrain may determine their reception.

Morse Code is not shown in NAVAID boxes on High Altitude Charts.

CONTROLLED AIRSPACE

Controlled airspace consists of those areas where some or all aircraft may be subjected to air traffic control within the following airspace classifications of A, B, C, D, & E.

**Class A Airspace** is depicted as open area (white) on the Enroute High Charts. It consists of airspace from 18,000 MSL to FL600.

**Class B Airspace** is depicted as screened blue area with a solid line encompassing the area.

**Class C Airspace** is depicted as screened blue area with a dashed line encompassing the area.

**Class B and Class C Airspace** consist of controlled airspace extending upward from the surface or a designated floor to specified altitudes, within which all aircraft and pilots are subject to the operating rules and requirements specified in the Federal Aviation Regulations (FAR) 71. Class B and C Airspace are shown in abbreviated forms on Enroute Low Altitude charts. A general note adjacent to Class B airspace refers the user to the appropriate VFR Terminal Area Chart.

**Class D Airspace** (airports with an operating control tower) are depicted as open area (white) with a "D" enclosed within a box following the airport name.

**Class E Airspace** is depicted as open area (white) on the Enroute Low Charts. It consists of airspace below 18,000 MSL.

Airports within which fixed-wing special VFR flight is prohibited are shown as:

NO SVFR  
AIRPORT NAME

Air Route Traffic Control Centers (ARTCC) are established to provide Air Traffic Control to aircraft operating on IFR flight plans within controlled airspace, particularly during the enroute phase of flight. Boundaries of the ARTCCs are shown in their entirety using the symbol below. Center names are shown adjacent and parallel to the boundary line.



Air Route Traffic Control Center (ARTCC)

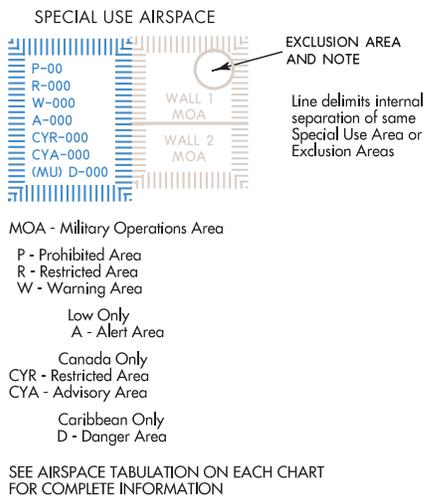
ARTCC sector frequencies are shown in boxes outlined by the same symbol.



ARTCC Remoted Sites with discrete VHF and UHF frequencies

### SPECIAL USE AIRSPACE

Special use airspace confines certain flight activities or restricts entry, or cautions other aircraft operating within specific boundaries. Special use airspace areas are depicted on aeronautical charts. Special use airspace areas are shown in their entirety, even when they overlap, adjoin, or when an area is designated within another area. The areas are identified by type and identifying number or name (R4001), effective altitudes, operating time, weather conditions (VFR/IFR) during which the area is in operation, and voice call of the controlling agency, on the back or front panels of the chart. Special Use Airspace with a floor of 18,000' MSL or above is not shown on the Enroute Low Altitude Charts. Similarly, Special Use Airspace with a ceiling below 18,000' MSL is not shown on Enroute High Altitude Charts.



### OTHER AIRSPACE

**Mode C Required Airspace** (from the surface to 10,000' MSL) within 30 NM radius of the primary airport(s) for which a Class B airspace is designated, is depicted on Enroute Low Altitude Charts. Mode C is also depicted within 10 NM of all airports listed in Appendix D of FAR 91.215 and the Airman's Information Manual (AIM).



Mode C is required within the limits of a Class C airspace up to 10,000' MSL.

### INSTRUMENT AIRWAYS

The FAA has established two fixed route systems for air navigation. The VOR and LF/MF (low or medium frequency) system—designated from 1,200' AGL to but not including 18,000' MSL—is shown on Low Altitude Enroute Charts, and the Jet Route system—designated from 18,000' MSL to FL 450 inclusive—is shown on High Altitude Enroute Charts.

### VOR LF/MF AIRWAY SYSTEM (LOW ALTITUDE ENROUTE CHARTS)

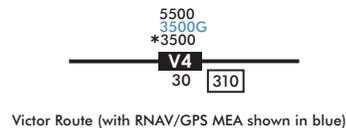
In this system VOR airways—airways based on VOR or VORTAC nav aids—are depicted in black and identified by a "V" (Victor) followed by the route number (e.g., "V12"). In Alaska, some segments of low-altitude airways are based on LF/MF nav aids and are charted in brown instead of black.

LF/MF airways—airways based on LF/MF nav aids—are sometimes called "colored airways" because they are identified by color name and number (e.g., "Amber One", charted as "A1"). Green and Red airways are plotted east and west, and Amber and Blue airways are plotted north and south. Regardless of their color identifier, LF/MF airways are shown in brown. U.S. colored airways exist only in Alaska, those within the conterminous U.S. have been rescinded. (Note: In Mexican airspace on FAA charts, LF/MF airways are charted in black).

### AIRWAY/ROUTE DATA

On both series of Enroute Charts, airway/route data such as the airway identifications, bearings or radials, mileages, and altitude (e.g., MEA, MOCA, MAA) are shown aligned with the airway and in the same color as the airway.

Airways/Routes predicated on VOR or VORTAC nav aids are defined by the outbound radial from the nav aid. Airways/Routes predicated on LF/MF nav aids are defined by the inbound bearing.



### OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)

The Off Route Obstruction Clearance Altitude (OROCA) is represented in thousands and hundreds of feet above mean sea level. The OROCA represents the highest possible elevation including both terrain and other vertical obstructions (towers, trees., etc.) bounded by the ticked lines of latitude and longitude. In this example the OROCA represents 12,500 feet.

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OROCA is computed just as the Maximum Elevation Figure (MEF) found on Visual charts except that it

provides an additional vertical buffer of 1,000 feet in designated non-mountainous areas and a 2,000 foot vertical buffer in designated mountainous areas within the United States. Unlike a MEF, when determining an OROCA the area 4 NM around each quadrant is analyzed for obstructions. Evaluating the area around the quadrant provides the chart user the same lateral clearance an airway provides should the line of intended flight follow a ticked line of latitude or longitude. OROCA does not provide for NAVAID signal coverage, communication coverage and would not be consistent with altitudes assigned by Air Traffic Control. OROCA's can be found over all land masses and open water areas containing man-made obstructions (such as oil rigs). OROCA's are shown in every 30 x 30 minute quadrant on Area Charts, every one degree by one degree quadrant for U.S. Low Altitude Enroute Charts and every two degree by two degree quadrant on Alaska Low Enroute Charts.

### MILITARY TRAINING ROUTES (MTRs)

Military Training Routes (MTRs) are routes established for the conduct of low-altitude, high-speed military flight training (generally below 10,000 feet MSL at airspeeds in excess of 250 knots IAS). These routes are depicted in brown on Enroute Low Altitude Charts, and are not shown on inset charts or on IFR Enroute High Altitude Charts. Enroute Low Altitude Charts depict all IR (IFR Military Training Route) and VR (VFR Military Training Route) routes, except those VRs that are entirely at or below 1500 feet AGL.

Military Training Routes are identified by designators (IR-107, VR-134) which are shown in brown on the route centerline. Arrows indicate the direction of flight along the route. The width of the route determines the width of the line that is plotted on the chart:

Route segments with a width of 5 NM or less, both sides of the centerline, are shown by a .02" line.  IR-000 →

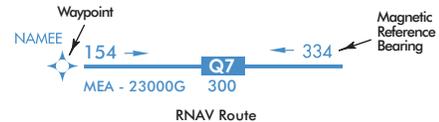
Route segments with a width greater than 5 NM, either or both sides of the centerline, are shown by a .035" line.  VR-000 →

### JET ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)

Jet routes are based on VOR or VORTAC nav aids, and are depicted in black with a "J" identifier followed by the route number (e.g., "J12"). In Alaska, some segments of jet routes are based on LF/MF nav aids and are shown in brown instead of black.

### RNAV "Q" ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)

Recently, the FAA adopted certain amendments to Title 14, Code of Federal Regulations which paved the way for the development of new area navigation (RNAV) routes in the U.S. National Airspace System (NAS). These amendments enable the FAA to take advantage of technological advancements in navigation systems such as the Global Positioning System (GPS). Initially, these RNAV routes are being established only in the high altitude en route structure for use by suitably equipped aircraft. RNAV routes and associated data will be charted in



aeronautical blue. Magnetic reference bearings will be shown originating from a waypoint, fix/reporting point, or nav aid. Joint Jet/RNAV route identification boxes will be located adjacent to each other with the route charted in black. RNAV MEAs will be identified with a "G" suffix. Altitude values will be stacked highest to lowest.



### TERRAIN CONTOURS ON AREA CHARTS

The National Transportation Safety Board (NTSB) recently recommended that terrain be added to Area Charts to increase pilots' situational awareness of terrain in the terminal area and to increase the safety of flight. When the terrain on an Area Chart rises at least 1000' above the airport elevation, terrain will be depicted in shades of brown. The initial contour value (lowest elevation) depicted will be at least 1000', but no more than 2000' above the airport elevation. The initial contour value may be less than 1000' only if needed to depict a rise in terrain close to the airport. Subsequent contour values will be depicted at a whole 1000' increment (2000'/4000', etc., NOT 2500'/4500', etc.). The following Area Charts are affected: Anchorage, Denver, Fairbanks, Juneau, Los Angeles, Prudhoe Bay, San Francisco and Vancouver.

The following boxed notes are added to affected Area Charts as necessary:

NOTE: TERRAIN CONTOURS HAVE BEEN ADDED TO THOSE AREA CHARTS WHERE THE TERRAIN ON THE CHART IS 1000 FOOT OR GREATER THAN THE ELEVATION OF THE PRIMARY AIRPORT

UNCONTROLLED AIRSPACE BOUNDARIES ARE DEPICTED WITH A SOLID BROWN LINE AND A .125" WIDE SHADED BROWN BAND. THE SHADED SIDE REPRESENTS THE UNCONTROLLED SIDE